

Listing of Claims:

1. (Original) An implantable system, comprising:

a housing;

energy delivery circuitry provided in the housing;

detection circuitry provided in the housing;

one or more subcutaneous electrodes configured for subcutaneous, non-intrathoracic placement in a patient and coupled to the energy delivery and detection circuitry;

a lead interface provided on the housing and coupled to the energy delivery and detection circuitry, the lead interface configured to receive at least one lead comprising one or more lead electrodes, the one or more lead electrodes configured for intrathoracic placement in the patient; and

a controller provided in the housing and coupled to the lead interface and the energy delivery and detection circuitry, the system operable in a first configuration using the one or more subcutaneous electrodes in the absence of the at least one lead and operable in a second configuration using at least the one or more lead electrodes, the system capable of providing cardiac activity sensing and stimulation in each of the first and second system configurations, respectively.

2. (Original) The system according to claim 1, wherein the system is configurable to operate in the first configuration using only the one or more subcutaneous electrodes.

3. (Original) The system according to claim 1, wherein the system is configurable to operate in the second configuration using only the one or more lead electrodes.

4. (Original) The system according to claim 1, wherein the system is configurable to operate in the second configuration using selected ones of the subcutaneous and lead electrodes.

5. (Original) The system according to claim 1, further comprising a can electrode provided at the housing, the system configurable to use the can electrode in one or both of the first and second configurations.
6. (Original) The system according to claim 1, wherein a unipolar configuration is selectable in the second configuration for one or more of sensing, pacing, and shocking using a selected one of the lead electrodes and a selected one of the subcutaneous electrodes.
7. (Original) The system according to claim 1, further comprising a switching matrix coupled to the detection and energy delivery circuitry, the subcutaneous electrodes, and to the lead electrodes via the lead interface, the controller configuring the switching matrix to couple selected ones of the lead and subcutaneous electrodes with selected inputs or outputs of the detection and energy delivery circuitry.
8. (Original) The system according to claim 1, further comprising a switching matrix coupled to the detection and energy delivery circuitry, the subcutaneous electrodes, and to the lead electrodes via the lead interface, the controller configuring the switching matrix to couple selected ones of the lead and subcutaneous electrodes with selected inputs and outputs of the detection and energy delivery circuitry to perform a capture threshold determination.
9. (Original) The system according to claim 1, wherein the lead interface comprises one or both of a ventricular lead interface and an atrial lead interface.
10. (Original) The system according to claim 1, wherein the lead interface comprises one or both of a pacing lead interface and a defibrillation lead interface.
11. (Original) The system according to claim 1, wherein the lead interface comprises a bi-ventricular lead system interface or a multi-site lead system interface.

12. (Original) The system according to claim 1, wherein the lead interface comprises one or more of a transvenous lead interface, an endocardial lead interface, and an epicardial lead interface.

13. (Original) The system according to claim 1, wherein the controller configures the system to selectively operate in one of the first and second configurations in response to a signal received from a patient-external signal source.

14. (Original) The system according to claim 1, wherein the controller configures the system to operate in one of the first and second configurations, and, in response to a predetermined condition, configures the system to operate in the other of the first and second configurations.

15. (Original) The system according to claim 14, wherein the predetermined condition comprises a predetermined heart rhythm.

16. (Original) The system according to claim 14, wherein the predetermined condition comprises an arrhythmia, unsuccessful detection of an arrhythmia, or treatment of an arrhythmia.

17. (Original) The system according to claim 14, wherein the predetermined condition comprises expiration of a predetermined duration of time or occurrence of a scheduled event.

18. (Original) The system according to claim 1, wherein the controller configures the system to operate concurrently in the first and second configurations.

19. (Original) The system according to claim 1, wherein the controller configures the system to switch operation between the first and second configurations to detect a heart rhythm or treat an arrhythmia using each of the first and second configurations.

20. (Original) The system according to claim 1, wherein:
at least two of the lead electrodes are disposed in a single heart chamber; and
the second configuration provides one or both of multisite sensing and
multisite energy delivery.

21. (Original) The system according to claim 1, wherein the controller:
configures the system to operate in one of the first and second configurations
to perform a first function; and
configures the system to operate in the other of the first and second
configurations to perform a second function, wherein performance of the first function
enhances performance of the second function.

22. (Original) The system according to claim 21, wherein the first function comprises a first
energy delivery function to instill organization in an arrhythmia, and the second function
comprises a second energy delivery function to terminate the arrhythmia.

23. (Original) The system according to claim 1, wherein:
the at least one lead comprises an atrial lead; and
the controller configures the system to provide one or both of bradycardia
pacing and antitachycardia pacing.

24. (Original) The system according to claim 1, wherein:
the at least one lead comprises an atrial lead;
the second configuration provides atrial activity sensing and atrial arrhythmia
therapy delivery; and
the first configuration provides backup ventricular tachyarrhythmia therapy
support for the second configuration.

25. (Original) The system according to claim 1, wherein:
the at least one lead comprises an atrial lead having one or more atrial electrodes; and
the controller configures the system to operate in the first configuration to provide tachyarrhythmia discrimination using the one or more subcutaneous electrodes and the one or more atrial electrodes.
26. (Original) The system according to claim 1, wherein the housing defines a unitary structure, and each of the subcutaneous electrodes is respectively provided on the housing.
27. (Original) The system according to claim 1, wherein the controller determines a transthoracic impedance using at least two of the electrodes.
28. (Original) The system according to claim 27, wherein the controller detects disordered breathing using the transthoracic impedance.
29. (Original) The system according to claim 1, wherein the controller acquires electrocardiograms for storage in a memory coupled to the controller.
30. (Original) The system according to claim 1, wherein the controller acquires diagnostics for storage in a memory coupled to the controller.
31. (Original) The system according to claim 1, further comprising a communications device coupled to the controller, the communications device configured for communicating with a patient-external programmer or a patient-external network system.

32. (Original) An implantable system, comprising:

a housing;

energy delivery circuitry provided in the housing;

detection circuitry provided in the housing;

one or more subcutaneous electrodes configured for subcutaneous, non-intrathoracic placement in a patient and coupled to the energy delivery and detection circuitry;

a lead interface provided on the housing and coupled to the energy delivery and detection circuitry, the lead interface configured to receive at least one lead comprising one or more lead electrodes, the one or more lead electrodes configured for intrathoracic placement in the patient; and

a controller provided in the housing and coupled to the lead interface and the energy delivery and detection circuitry, the system operable in a first configuration using the one or more subcutaneous electrodes in the absence of the at least one lead and operable in a second configuration using at least the one or more lead electrodes, the system capable of providing cardiac activity sensing and stimulation in each of the first and second system configurations, respectively, the system configurable to perform a particular function in each of the first and second configurations and to acquire performance data associated with performance of the particular function in each of the first and second configurations.

33. (Original) The system according to claim 32, wherein the particular function comprises a function associated with sensing.

34. (Original) The system according to claim 32, wherein the particular function comprises a function associated with tachyarrhythmia detection.

35. (Original) The system according to claim 32, wherein the particular function comprises a function associated with bradycardia detection.

36. (Original) The system according to claim 32, wherein the particular function comprises a first sub-function associated with rate-based tachyarrhythmia detection and a second sub-function associated with morphology-based tachyarrhythmia detection.

37. (Original) The system according to claim 32, wherein the particular function comprises a function associated with one or both of stimulus waveform generation and stimulus waveform delivery.

38. (Original) The system according to claim 32, wherein the particular function comprises a function involving a configuration of one or both of the lead electrodes and the subcutaneous electrodes.

39. (Original) The system according to claim 32, wherein the housing defines a unitary structure, and each of the subcutaneous electrodes is respectively provided on the housing.

40. (Original) The system according to claim 32, further comprising a communications device coupled to the controller, the communications device configured for communicating with a patient-external programmer or a patient-external network system.

41-77. (Canceled)

78. (Original) A cardiac sensing and stimulation system, comprising:

- means for sensing cardiac activity;
- means for generating a cardiac stimulation therapy,
- means for coupling at least one lead to the sensing and generating means when operating the system in a second configuration, the at least one lead comprising one or more lead electrodes configured for intrathoracic placement;
- means for enabling operation of the system in the second configuration in response to the coupling means receiving the at least one lead;
- means for operating the system in a first configuration using subcutaneous, non-intrathoracic electrodes coupled to the sensing and generating means in the absence of the at least one lead; and
- means for sensing cardiac activity and delivering the cardiac stimulation therapy in each of the first and second configurations.

79. (Original) A cardiac sensing and stimulation system, comprising:

- means, using only subcutaneous, non-intrathoracic electrodes, for sensing cardiac activity and delivering cardiac stimulation therapy in a first configuration;
- means, using selected ones of intrathoracic and the non-intrathoracic electrodes, for sensing cardiac activity and delivering cardiac stimulation therapy in a second configuration;
- means for performing a particular function when operating in each of the first and second configurations; and
- means for acquiring performance data associated with performance of the particular function when operating in each of the first and second configurations.

80. (Original) The system according to claim 79, further comprising means for producing comparison data using the performance information, the comparison data comprising data indicative of performance when operating the system in one of the first and second configurations relative to the other of the first and second configurations.

81. (Original) An implantable system, comprising:

a housing;

energy delivery circuitry provided in the housing;

detection circuitry provided in the housing;

a switching matrix provided in the housing and coupled to the detection and energy delivery circuitry, the switching matrix comprising first and second electrode connection arrangements, the first electrode connection arrangement configured for coupling with one or more subcutaneous, non-intrathoracic electrodes and the second electrode connection arrangement configured for coupling with one or more intrathoracic electrodes; and

a controller provided in the housing and coupled to the switching matrix and the energy delivery and detection circuitry, the controller configuring the system to operate in a first configuration by enabling only the first electrode connection arrangement and to operate in a second configuration by enabling at least the second electrode connection arrangement.

82. (Original) The system of claim 81, wherein the controller configures the system to operate in the second configuration by enabling the first and second electrode connection arrangements.

83. (Original) The system of claim 81, wherein the controller configures the switching matrix to enable selected electrode connections of the first and second electrode connection arrangements.

84. (Original) The system of claim 81, wherein the controller configures the switching matrix to couple selected electrode connections of the first and second electrode connection arrangements with selected inputs or outputs of the detection and energy delivery circuitry.

85. (Original) The system of claim 81, wherein one or both of the first and second electrode connection arrangements comprises a lead interface, the lead interface facilitating mating engagement with a cardiac lead or module.

86. (Original) The system of claim 81, wherein the first and second electrode connection arrangement comprises a lead interface, the lead interface facilitating mating engagement with a cardiac lead or module.

87. (Original) The system of claim 81, wherein the first or second configuration comprises a cardiac activity monitoring-only configuration.

88. (Original) The system of claim 81, wherein the first or second configuration comprises a cardiac energy delivery configuration.

89. (Original) The system of claim 81, wherein each of the first and second configurations comprise a cardiac monitoring and energy delivery configuration.

90. (Original) An implantable system, comprising:

- a housing;

- energy delivery circuitry provided in the housing;

- detection circuitry provided in the housing;

- an interface provided on the housing and coupled to the energy delivery and detection circuitry, the interface configured to receive at least one intrathoracic electrode arrangement and at least one subcutaneous non-intrathoracic electrode arrangement; and

- a controller provided in the housing and coupled to the interface and the energy delivery and detection circuitry, the system operable in a first configuration using only the subcutaneous non-intrathoracic electrode arrangement, in a second configuration using only the intrathoracic electrode arrangement, and in a third configuration using the non-intrathoracic and intrathoracic electrode arrangements, the system capable of providing

cardiac activity sensing and stimulation in each of the first, second, and third system configurations, respectively.

91. (Original) The system of claim 90, wherein the system is operable only in the first configuration in the absence of connectivity between the intrathoracic electrode arrangement and the interface.

92. (Original) The system of claim 91, wherein coupling the intrathoracic electrode arrangement to the interface enables operation of the system in the second configuration or the third configuration.

93. (Original) The system of claim 90, wherein the system is operable only in the second configuration in the absence of connectivity between the subcutaneous non-intrathoracic electrode arrangement and the interface.

94. (Original) The system of claim 93, wherein coupling the subcutaneous non-intrathoracic electrode arrangement to the interface enables operation of the system in the first configuration or the third configuration.

95. (Canceled)